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(56) Documents Cited

GB 2319422 A WO 92/11614 A1 US 4630110 A

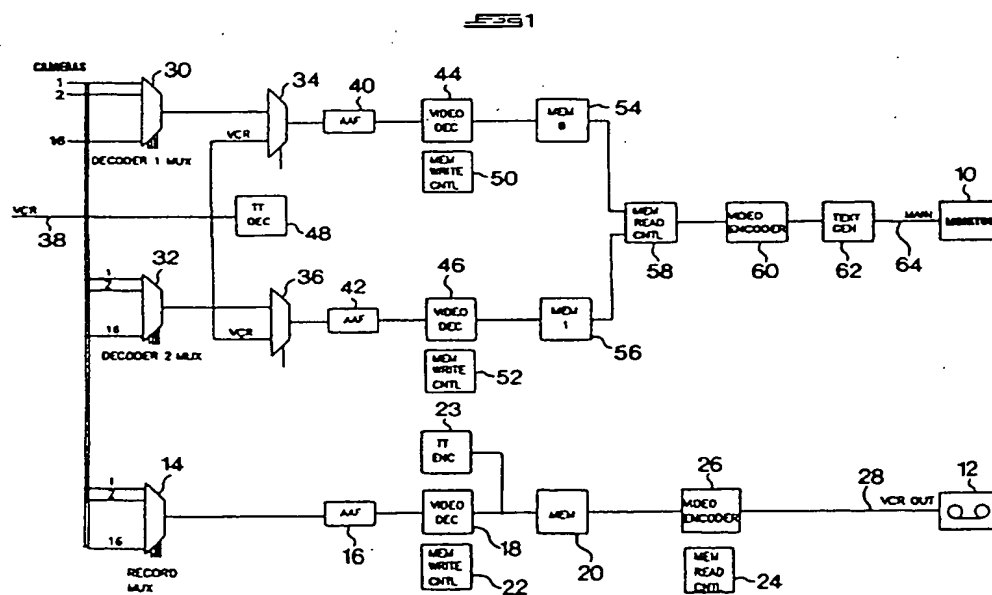
(58) Field of Search

UK CL (Edition P) H4F FAAE FAAX FDX  
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(54) Abstract Title

**Video surveillance system in which live and previously recorded images may be simultaneously displayed**

(57) The invention relates to a method of operating a surveillance system comprising a plurality of video cameras 1-16, a monitor 10 and a video recorder 12. The video cameras and monitor are controlled by a central controller, typically multiplexers 30, 32, 14 which can display multiple cameras on one monitor and also send the information from several cameras to the video recorder 12 by using time division multiplexing (TDM). The central controller is typically built around a microprocessor-based central processing unit (CPU). The system is able to play back 38 recordings from a video recorder, so that recorded images can be examined. The playback of recorded images takes place simultaneously with the ongoing monitoring of live images, and does not interrupt the on-going recording of new images. Input 38 may be connected to video recorder 12 or another recorder.



At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

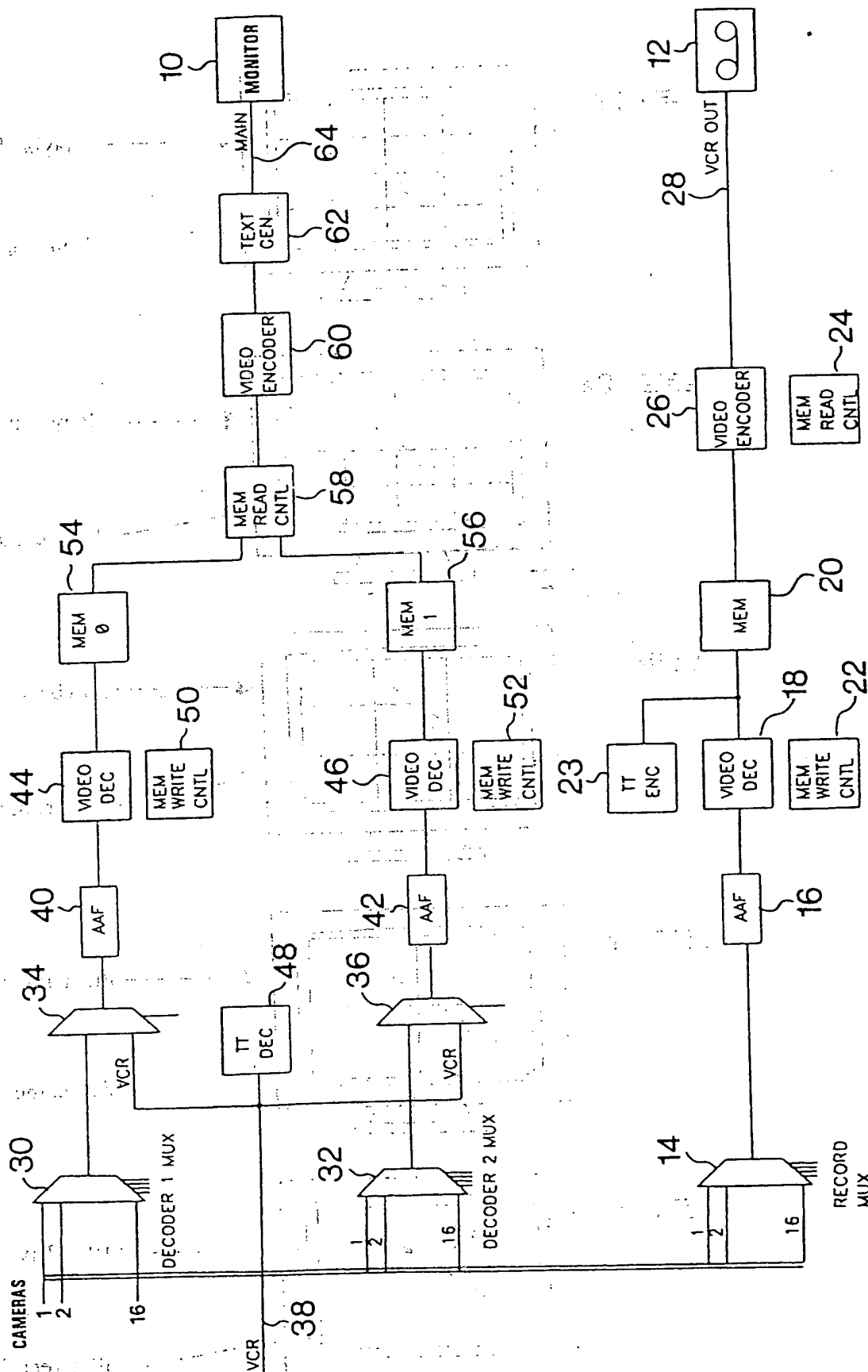
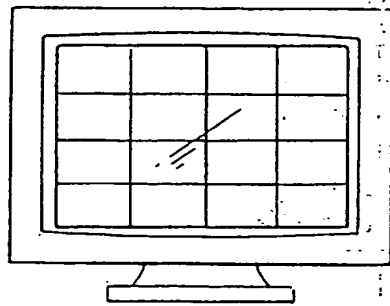


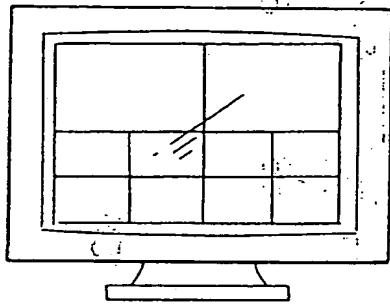
FIG 2A



Playback cameos (8)

Live cameos (8)

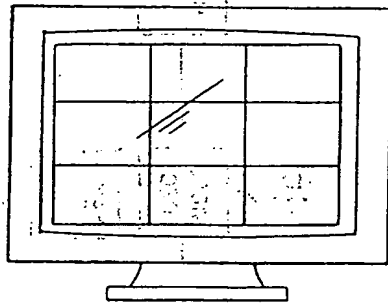
FIG 2B



Playback cameos (2)

Live cameos (8)

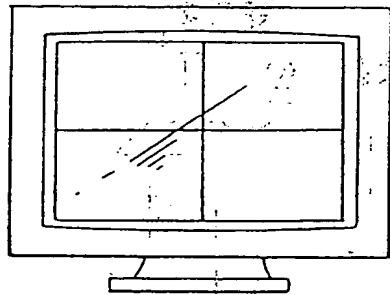
FIG 2c



Playback cameos (3)

Live cameos (6)

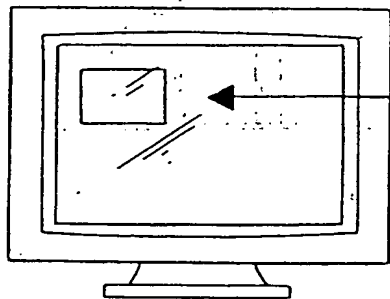
FIG 2d



Playback cameos (2)

Live cameos (2)

FIG 2E



PIP is Live (1)

Full screen is Playback (1)

### **BACKGROUND OF THE INVENTION**

THIS invention relates to a method of operating a surveillance system comprising a plurality of video cameras and to a controller for implementing the method.

Surveillance systems comprising a plurality of video cameras and associated monitors are widely used. The video cameras and monitors are controlled by a central controller, typically a multiplexer which can display multiple cameras on one monitor and also send the information from several cameras to a single video recorder by using time division multiplexing (TDM). The central controller is typically built around a microprocessor-based central processing unit (CPU).

It is also desirable for the system to be able to play back recordings from a video recorder, so that recorded images can be examined, for example to review suspicious events which have been recorded. Preferably, such playback of recorded images should not interrupt the on-going recording of new images, and it is also desirable that such playback take place simultaneously with the ongoing monitoring of live images.

So-called duplex multiplexing systems are known which permit a user to select between the display of live or recorded data while also recording the live data. It is an object of the invention to provide a system which is even more versatile.

## SUMMARY OF THE INVENTION

According to the invention there is provided a method of operating a surveillance system having a plurality of video sources, a video monitor, and a video recorder, the method comprising:

selecting outputs of one or more desired sources;

feeding the selected outputs to a video monitor for display as a "live" video image;

feeding an output of a video recorder, corresponding to stored outputs of said one or more desired sources, to the monitor for simultaneous display as a "playback" video image; and

simultaneously feeding said selected outputs to a video recorder for recordal thereof.

The video sources will usually be video cameras, such as surveillance cameras.

Data which identifies the video source may be added to the video output to enable the source to be correctly identified.

The selected outputs may be displayed singly, or together, so that the video monitor displays both "live" and "playback" video images, each of which in turn comprises one or more camera outputs.

Further according to the invention there is provided a controller for a surveillance system having a plurality of video sources, a video monitor, and a video recorder, the controller comprising:

first, second and third input multiplexer means each operable to select a desired one or more of the sources;

a first channel arranged to receive an output from the first input multiplexer means and to generate a video output signal for use by a video recorder; and

second and third channels each arranged to receive an output from either the second or third input multiplexer means, respectively, or

an output of a video recorder,

wherein outputs of the second and third channels are combined in a common video output for use by a video monitor, so that the monitor can display both

live and recorded video images while the data corresponding to the live images is recorded simultaneously.

Each of the second and third channels preferably comprises a secondary multiplexer for selecting between an output of the second or third input multiplexer means, respectively, or an output of a video recorder.

Each channel may further comprise a signal conditioning and anti-aliasing filter and a video decoder for digitising the output of the signal conditioning and anti-aliasing filter.